COSC 350 Assignment 3 Spring 2023

Due: 11:59 pm Friday May 12.

Upload to BB a single zip file GroupNameA3 for your group that has the 2 Java source code files for the server and client named as GroupNameA3Server.java and GroupNameA3Client.java.

Write a TCP socket program that allows the server (router R1: IP 10.55.1.1) to receive a DVR message from the client (router R2: IP 10.55.1.2) and then update R1’s routing table using the DVR algorithm. The server and client must do the following (values are given below just as an example).

Server R1

1. R1 (server: 10.55.1.1) first reads a file rt.txt containing R1’s IP address, number of neighbors, R1’s neighbor distances, number of entries in R1’s routing table and R1’s initial routing table stored in the following form (the meaning of each line in the file is given as text after the //, but neither the // nor the text is stored in the file):

10.55.1.1 //IP address of router R1 (server)

2 //number of neighbors

10.55.1.2 10.55.1.3 //IP addresses of neighbors

5 3 //neighbor distances (same as edge weights or link costs in the network graph)

5 //number of entries in routing table

10.55.1.0 10.55.2.0 10.55.3.0 10.55.4.0 10.55.5.0 //IP addresses of destination networks in routing table

10.55.1.1 10.55.1.2 10.55.1.3 10.55.1.3 10.55.1.3 //IP address of next hop to reach each destination network

0 5 3 3 12//distance to each destination network

So R1’s initial routing table is as follows:

|  |  |  |
| --- | --- | --- |
| Destination Network | Next Hop | Distance |
| 10.55.1.0 | 10.55.1.1 (direct) | 0 |
| 10.55.2.0 | 10.55.1.2 | 5 |
| 10.55.3.0 | 10.55.1.3 | 3 |
| 10.55.4.0 | 10.55.1.3 | 3 |
| 10.55.5.0 | 10.55.1.3 | 12 |

2. R1 (server: IP 10.55.1.1) waits for a TCP socket connection on port 4321 from R2 (client: IP 10.55.1.2) to receive the DVR message from R2.

3. R1 receives the DVR message and prints the message “DVR message received” followed by the entire contents of the message received.

4. R1 uses the DVR algorithm to update its routing table using the DVR message.

5. R1 prints its IP address followed by its updated routing table.

Client R2

1. R2 (client: IP 10.55.1.2) first reads a file dvr.txt containing the IP address of the server R1 and information in the DVR message to be sent to R1 (server: IP 10.55.1.1) stored in the following form (the meaning of each line in the file is given as text after the //, but neither the // nor the text is stored in the file)

10.55.1.1 //IP address of server R1

10.55.1.2 //IP address of client R2

5 //number of entries in DVR message: 5

10.55.1.0 10.55.2.0 10.55.3.0 10.55.4.0 10.55.5.0 //destination network IP addresses in DVR message

5 9 8 0 6 //distances to each destination network in DVR message

2. R2 (client: 10.55.1.2) uses the preceding information to form the DVR message to be sent over the socket:

10.55.1.1 //server IP

10.55.1.2 //client IP

5 //number of entries in DVR message: 5

10.55.1.0 10.55.2.0 10.55.3.0 10.55.4.0 10.55.5.0 //destination network IP addresses in DVR message

5 9 8 0 6 // distances to each destination network in DVR message

3. R2 (client: 10.55.1.2) makes a TCP socket connection to R1 (server: IP 10.55.1.1) on port 4321 and sends the DVR message as above to R1. It then prints the message “DVR message sent”.